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DEPARTMENT OF
INFORMATION NETWORKS

Université des Acadiens

May 1, 1995

Office of the Secretary
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

Revision of the Commission Rules
To Ensure Compatibility with Enhanced
911 Emergency Calling Systems
CC Docket No. 94-102
RM-8143

In Informal Reply to the NPRM . . .

As the Director of Information Networks at the University of Southwestern Louisiana (USL) I have recently been tasked with the integration of the USL campus telephone system with the new Enhanced 911 (E911) system under installation in Lafayette Parish. I have only recently found and identified this NPRM as a significant factor in the interconnection of Private Branch Exchanges (PBXs), in campus type environments, for the delivery of E911 services. These comments only reflect upon the PBX issues, USL has no wireless operation.

I would like to address the following areas of concern for your consideration as you revise the rules:

(1) Proposed rule connectivity between: (a) the PBX and the CO, and (b) the PBX and the Dual Tandem Switch supporting 911 traffic,
(2) The PBX non-DID extension and its ALI record,
(3) Transmission of ALI database information.

The PBX market exists because users needed to operate in a manner different from the environment provided by the Local Exchange Provider (LEC) services. Noting some of

these differences is important. The differences point directly to the difficult issues in providing 911 services for the PBX user. To address the needs of its internal operations USL acquired a private switch, and we envision most PBX owners do so, for some mixture of advantages (the advantages are the differences from LEC service). The list of PBX advantages includes:

(A) The number of PBX stations (extensions) in the configuration can greatly exceed the Direct Inward Dial (DID) number space used by the inward trunking. This is a cost control measure and is also desirable considering the limited space remaining in the North American Numbering Plan (NANP).

(B) The PBX owner can place stations at locations that have very low traffic, yet provide tactical and emergency communications without financial hardship.

(C) At the owner's discretion, stations can be made uncallable from outside the facility.

(D) At the owner's discretion, stations can be restricted from dialing outside the facility, but retain the ability to dial stations within the system.

(E) Fine mixtures of restrictions and authorizations can be locally designed and implemented.

(F) Digital PBXs can be connected to the LEC with high quality and high density digital ISDN-PRI services.

(G) A small staff can design and manage complex calling relationships to further the operation of the facility.

(H) A PBX is interconnected to the PSTN *via the LEC* and is not an independent telephone company. The LEC remains a remote resource and service to provide advanced support to interface to the remainder of the PSTN.

1. In the NPRM Section 68.320 standards are provided for E911 trunking. All references to trunking reflect traditional analog trunk technology. In USLs situation of almost 250 trunks only five (5) are analog. These trunks exist only to service the 10-XXX requirement of the regulations and are planned to be removed when the LEC can provide the same toll call screening on ISDN-PRI as they do on analog trunks (TBE and SCCS). The ISDN-PRI services are promoted by the switch manufactures and the LEC as Calling Party Number (defined as SNI in the NPRM) and Calling Party Name capable (we do not consider Calling Party Name a replacement for ALI). Today, our SNI is delivered to other ISDN users of the LEC (and possibly analog Caller ID subscribers of

the LEC), but the Bill To Number (BTN) of the ISDN trunk is delivered to PSAP position although the ISDN D channel has been sent and the LEC central office switch has received the proper SNI information.

Interconnection of the PBX to E911 services in the NPRM appears to be limited to analog trunks with MF ANI signaling. For a digital PBX that does not generate MF tones or does not have any existing analog trunking, these requirements are a significant hurdle and a significant expense. Solutions that include auxiliary processing units attached to the PBX simply increase the probability of failure to deliver or increase the potential of misidentification of a 911 call. The switch is already delivering the SNI via the ISDN-PRI D channel to the LEC in ready to use digital form.

Our desire, and a sound solution for the new generation of PBXs, is to pass 911 traffic over an ISDN-PRI facility to the LEC and require the LEC to relay the SNI information to the Dual Tandem that supports E911 by using whatever method they use for the remainder of the subscribers on the central office switch. We pass SNI information today for those stations that have a relationship to a DID number and have the ability for unique identification of non-DID extensions (further discussion in a later section).

The NPRM suggests that we (unlike other LEC subscribers) bypass traffic to 911 services away from our normal connection to the LEC and deliver them directly to the tandem serving 911 operations. This will remove the ability to process a 911 call on any one of more than 200 trunks and restrict its ability to successfully complete to one or two special service trunks. Some proposed solutions address rollover of 911 traffic to regular trunks with a corresponding lost of SNI and ALI information. We suggest that ALI is significant and should always be available. Also, all 'rollover' plans to process overflow traffic that we have investigated include activation of PBX features that are an invitation to toll fraud (which have never been locally enabled because of the greatly increased fraud possibilities).

2. The PBX can generate a unique identifier for each non-DID extension and delivering that number via the Calling Party Number field of the D channel information. We can easily generate up to a 15 digit unique code where the last five digits are the SNI. The remainder of the ALI database fields for a non-DID station would be the same as a DID station. Extensions that are DID numbers would simply report the DID number.

The standard for passing SNI for stations that do not have a relationship to a DID number in the NANP must be developed. A plan for SNI identification for non-DID extensions should:

(1) Not consume space in the NANP.
(2) Be extensible for PBX dialplans from two (2) to five (5) digits.
(3) Provide a readable display for Caller ID units.
(4) Not display information on Caller ID units that redirect a call-back away from the PBX location (e.g., no pseudo area code arrangements).
(5) Various ALI database standards must reflect this common presentation.

A suggested format for the SNI format for digital and analog service:

Station with DID service	AAANNNNNNN
Station without DID service	AAAMMMMMMSSSSS

Where AAA is the Area Code, NNNNNNN is the DID number, MMMMMMM is the main attendant number for the PBX, and SSSSS is a two (2) to five (5) digit extension number for a non-DID station. In this format a ten (10) digit number identifies a DID PBX station and a 12 to 15 digit number identifies a non-DID PBX station. This format meets the criteria listed above and the change should not be a difficult modification for the ALI database (increase field size to support five (5) more digits). In fact, from a POTS phone if the called party blindly redials either SNI format the call is returned as close as possible to the originating station.

We further note that ISDN-PRI services are billed for 911 service support. But, unlike other subscribers to the LEC the NPRM addresses methods to prohibit us from using those services to deliver 911 calls. The modified rules also would require us to purchase special analog trunking that is expensive and unusable for traffic other than 911 service. The special trunking simply provides SNI, something that we provide to our LEC today via ISDN.

3. The modern PBX allows users to move extensions without system administrator intervention. This means station locations that control ALI information can change without intervention by the person responsible for updates to ALI information. We can use auxiliary processors to query the switch for relations between station numbers and hardware port connections. A simple relational database will be able to relink station numbers with the required ALI information. Automation of the task would allow weekly if not more frequent upgrades of the ALI information. However, consider that we are comfortable with significant data processing operations. Other PBX users may not be

capabile of supporting complex programs to generate add, delete and change records to the ALI database. The interface between the PBX owner and the LEC to update ALI records must be as simple as possible.

Future implementations should consider changes to the PBX and the 911 system to allow the PSAP to inquire over the D channel (directly to the PBX) for the ALI information that would be stored on the switch. This is desirable, but would require very large changes to several layers of network architecture. This approach does negate the host of problems in supplying up to the minute information to the PSAP.

In an effort to make the ALI database as accurate as possible an effort should be made to:

(1) simplify the data format from the PBX owner to the LEC (again, we believe the LEC is where our service originates and therefore we should provide the ALI information to the LEC for inclusion in the ALI database),
(2) bundle complex programs to manipulate the PBX ALI data at a single point, either the LEC or the ALI database provider.

These efforts will reduce the number of errors injected into the system due to a multitude of various programs written by non-professionals that attempt to manipulate the ALI data.

The rules should require the lowest common denominator from the PBX owners to extract the most up to date and accurate information. This can be accomplished by using mechanisms that are available and understood by the vast majority of persons operating a PBX. This includes:

(1) Ability to build the PBX data base on a consumer class personal computer (PC). PC software requirements should be minimal.
(2) The data should be transfered to the LEC in ASCII format.
(3) The data should be in variable length fields, with a common field separator, and a single text line per PBX extension.
(4) No field should contain data that is repeated for the entire file.
(5) The PBX owner should have the options of commerical software, LEC provided software or developed in-house system.

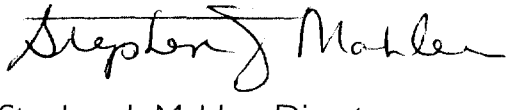
Although the FCC should allow the standards groups to fully define the file format, it is important to note how simple the format can be desgined. Requirements that increase

the complexity or rules that allow complexity will simply degrade the accuracy of the database. Note also, this example format is extensible and does not require significant effort to add additional information fields. The file format should address each NENA field. The fields that are constant throughout the file are defined first. The keyword FORMAT would contain the layout of the remaining lines. Only the fields that vary from station to station would appear below the FORMAT line. Each station in the PBX would require a single line. An example of this format would be an ASCII file on a DOS computer that looks like:

```
SOURCE=University of Southwestern Louisiana
MAINNUM=3184821000
DATE=950429
NPA=318
COMMUNITY=Lafayette
STATE=LA
CUSTOMERCODE=123
FORMAT|SNI|HNUM|HNUMSUF|PREDIR|ST|STSUF|POSTDIR|CUSTOMER
3184821111|120|||St Marys Blvd||Stephens Hall Rm 118
318482100015458|120|||St Marys Blvd||Stephens Hall Rm 119
END
```

PBX owners should be allow to download via a simple asynchronous protocol (e.g. kermit or zmodem) or use advanced Internet file transfer capabilities to move the ALI infomation file to the LEC. PBX owners should send only complete snapshots of the state of the PBX. The LEC would run the entire PBX configuration against the previous configuration and generate the necessary internal file formats to update the ALI database. The LEC would have a well tested and certified program to generate the various add, delete and change records required by the ALI database system. These steps will greatly decrease the possibility for errors in the database.

If additional information is required, please contact me at directly at one of the addresses provided below. Thank you for your consideration of these comments.



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